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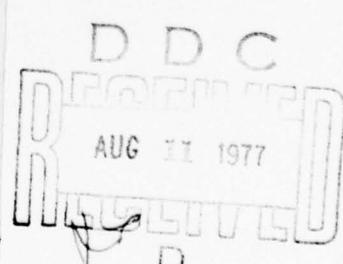


PROGRAM MANAGEMENT COURSE INDIVIDUAL STUDY PROGRAM

MILESTONE ZERO: ITS CHANGES ON THE
AIR FORCE ACQUISITION PROCESS

Study Project Report
PMC 77-1

Larry R. Gross
Major USAF

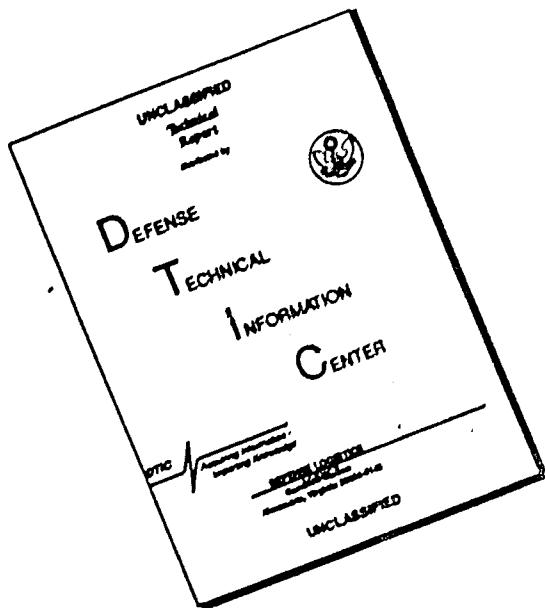


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MILESTONE ZERO: ITS CHANGES ON THE
AIR FORCE ACQUISITION PROCESS

Individual Study Program
Study Project Report
Prepared as a Formal Report

Defense Systems Management College
Program Management Course
Class 77-1

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May 1977

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This study project report represents the views, conclusions and recommendations of the author and does not necessarily reflect the official opinion of the Defense Systems Management College or the Department of Defense

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DEFENSE SYSTEMS MANAGEMENT COLLEGE

STUDY TITLE: MILESTONE ZERO: ITS CHANGES ON THE AIR FORCE ACQUISITION PROCESS

STUDY PROJECT GOALS:

1. To identify the changes imposed on the Air Force weapons system acquisition process by the new milestone-0 directed by DoD Directive 5000.1.
2. To examine the issues and actions associated with this change.

STUDY REPORT ABSTRACT:

This project examines the changes caused by the addition of milestone-0 to the weapon system acquisition process, particularly with respect to the activities leading to a program initiation decision. Since the Air Force has not issued directives to implement this new DoD policy, the unresolved issues are examined.

The supporting research included a literature survey to obtain the background and historical focus of past concerns which eventually lead to the current policy. The results of these past studies are summarized in this report. In addition, structured interviews were conducted at DDR&E, HQ USAF and HQ AFSC to obtain some perspective on the intent of the new policy as well as some insight on methods to implement it.

As a result, this report provides some criteria which the Secretary of the Air Force could use in recommending that a major program be initiated. A possible set of mission areas is presented which could be the basis for mission area analyses. Finally, changes to the existing requirements documentation process are offered.

SUBJECT DESCRIPTORS: DSARC Procedure for Program initiation relative to milestone-0 in the Air Force acquisition process.

NAME, RANK, SERVICE	CLASS	DATE
Larry R. Gross, Major, USAF	PMC 77-1	May 1977

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EXECUTIVE SUMMARY

This study project has two objectives: to examine the changes on Air Force weapons system acquisition resulting from the Milestone-0 described in DoD Directive 5000.1 and to assess the issues associated with this change.

The beginning activities leading to a Milestone-0 decision are the focus of this study and therefore relate primarily to major programs. Some Air Force implementing directives on this subject are in draft form, and those were reviewed to obtain a view of possible implementing schemes. The literature provided the historical background related to the current front-end structure and the perspective of past criticism which suggested the current policy. Germane recommendations from these studies are that the services conduct a continual mission area analysis, the services document their requirements in terms of defense needs rather than hardware capabilities, and the Secretary of Defense review the total defense requirements in terms of priority and resource constraints. The current policy is described and questions concerning its implementation are presented. The first issue concerns criteria which the Secretary of the Air Force could use for recommending a new program be designated as major. The top three factors are urgency in countering the threat, high priority defense mission deficiency, and potential public or Congressional interest. The second deals with the definition of a mission area. To be workable, mission areas must have some commonality with Congressional oversight, DDR&E functions, and service roles and missions. The set of mission areas must then contain Strategic Offense, Strategic Defense, Tactical Land Warfare, Ocean Control, Tactical Air Warfare, Mobility

& Logistics, Command-Control & Communications, Reconnaissance & Surveillance, Intelligence and Training. The third question is who should perform mission area analyses. The Air Staff, the operating commands and Air Force Systems Command can all contribute to the total mission area analysis effort by using their own unique talents and knowledge of the defense mission. The last issue deals with the documentation of requirements, Required Operation Capability (ROC) versus Mission Element Needs Statement (MENS). The ROC remains a valid method for documenting requirements, but the content must be changed so that a ROC can be the basis for a MENS.

ACKNOWLEDGMENTS

The author sincerely appreciated the assistance provided by his advisor, Commander Gerald Chasko. In addition, the comments offered by Brigadier General Esposito, USAF (Ret), Captain Trask, CSAF/ROXM and Mr. Bando, AFSC/XRX were the foundation for many of the concepts presented in this report.

SECTION I

INTRODUCTION

Purpose

As a group, major weapons systems are complex, costly and watched closely by a host of government bodies including the Congress, the General Accounting Office, and the Office of Management and Budget. The acquisition cost of a modern aircraft such as the B-1 and F-15 typically ranges in the tens of billions of dollars. (16:14)¹ Because of these large costs, the system acquisition process continues to be a subject of considerable controversy and review. As a result, the Department of Defense (DoD) policy and the Air Force guidance directed toward the acquisition process has changed frequently over the past several years. The primary motivation for change is to establish a framework for managing DoD resources so that a viable and credible military force can be established and maintained.

The most recent change is a result of former Deputy Secretary of Defense Clements' approving two new directives, DoD Directive 5000.1, Major Systems Acquisition and DoD Directive 5000.2, Major System Acquisition Process, both dated 18 January 1977. These new directives incorporate concepts contained in several past studies as well as Office of Management and Budget Circular A-109, Major System Acquisitions. One of the key features added to the acquisition process is a restructuring of the front-end via a Milestone-0 decision point. The events surrounding

1. This notation will be used throughout this report for sources of quotation or major references. The first number is the source listed in the bibliography. The second number is the page in the reference.

Milestone-0 hinge on a service generated document entitled, "Mission Element Needs Statement (MENS)" which describes a mission deficiency relative to an operational task as opposed to definitive hardware performance or characteristics. When the Secretary of Defense approves the MENS, the acquisition process is initiated, and the service can begin examining alternatives to fulfill the deficiency described in the MENS. The purpose of this study is to examine the acquisition process changes and issues resulting from Milestone-0 as related to Air Force Weapon System Programs and to examine some methods for resolving the issues.

Scope

The complete acquisition process contains four specific milestones leading to production and introduction of a new system into the operational force. This report does not consider development activities beyond the conceptual or beginning phases of the process; therefore, it concerns only those policy changes related to program initiation. The acquisition process is examined in terms of major systems and not non-major systems. This research is focused on the fundamental policy changes emanating from the current DoD Directive 5000.1 and those issues or unanswered questions posed by an untried process. The Air Force process is the central topic for this study, but a large part of this report could be applied to the Army and the Navy. The principal Air Force directives which implement the new acquisition policy are still in draft form; consequently, many of the opinions expressed resulted from structured interviews. In summary, this report discusses the anticipated changes in the formative stages of an Air Force acquisition program as well as the issues raised by Milestone-0.

SECTION II BACKGROUND

The present weapons system acquisition process has evolved from a continuous series of criticism and study resulting from the cost, technical performance and schedule difficulties experienced by past programs. The emphasis on front-end structuring which is the main thrust of Milestone-0 has its genesis in many study reports. The content of these reports provides a degree of focus on the issues related to the Conceptual Phase of the acquisition process; consequently, they provide a natural starting point for understanding the issues associated with Milestone-0. The following paragraphs are a synopsis of selected reports which contained an examination of the early phases of acquisition.

Blue Ribbon Defense Panel

The Blue Ribbon Defense Panel which was commissioned in July 1969 by the President and the Secretary of Defense examined very broad areas related to defense acquisition and management; nonetheless, they found some serious shortcomings in the acquisition process. They criticized the process for not giving the Office of the Secretary of Defense (OSD) any opportunity to review the sum total of service requirements in terms of OSD's priority and urgency for overall defense needs. Moreover, the services' requirement documents tended to describe the system specifications rather than operational needs, thereby restricting the kinds of alternatives considered for system development. (4:68). The Panel recommended that acquisition policy provide more flexibility in the method for selecting systems for development and multiple decision points throughout the acquisition cycle. (4:73).

Commission on Government Procurement

The Commission was created by public law in November 1969 by Congress to study and recommend methods for more economical, efficient and effective procurement. The Commission expressed concern on the total absence of visibility on decisions controlling the purpose and direction of acquisition programs. (7:70). The Commission noted several problems associated with the embryonic stages of the acquisition process. First, the defense requirements documents state needs in terms of a proposed solution rather than the defense problem. (7:97). Consequently, the need loses its emphasis in favor of the preferred system described to solve the problem. The need then becomes product oriented, thereby eliminating all other alternatives from consideration regardless of their capability or cost effectiveness. Secondly, each service separately defines its own needs without overall coordination by the Department of Defense. (7:97). This could allow each service to pursue new weapon systems based upon its view of countering a threat and to counter only those threats it deems important. There is a chance that an unneeded system could be developed or that a system could be acquired which has an overlapping function or capability with a system owned by a sister service. This situation also allows the services to compete for roles and missions in that the service which obtains a capability first can assume the role corresponding to that capability. (7:101). Thirdly, there is a premature commitment to a system concept and preliminary design resulting from the need statement; consequently, other viable system concepts may not be considered or given a fair evaluation. (7:114). Even though an interested government or industry group may propose an innovative system concept, the odds are that the system chosen for development will closely match the features

described by the military user who originated the need. (7:120).

The Commission also noted that Congress is not provided information concerning the needs and goals of a new system relative to national policy and priorities. (7:97). Typically, Congress reviews programs only after a system has been chosen to perform a given defense mission and that system is proposed for development funding. (7:98). The Congress should be interested in the requirements for a major system because it is responsible for funding the defense needs of the country; but unless it has an understanding of the needs and goals of proposed systems, the Congress cannot realistically perform that duty. (7:77). Through early debate and an adequate understanding of the defense issues, Congress can establish the relationship between proposed programs and national policy, thereby allocating resources in a national priority. The end result should be a shorter time frame for authorizing and appropriating funds for defense. (7:77).

The Commission made two recommendations pertinent to the early stages of weapons system development:

. Start the acquisition process with a statement of needs and goals that have been reconciled with overall agency capabilities and resources. State program needs or goals independent of any system product. Use long-term projections of mission capabilities and deficiencies prepared and coordinated by agency component to set program goals that specify:

(1) Total mission costs within which new systems should be bought and used.

(2) The level of mission capability to be achieved above that of projected inventories and existing systems.

(3) The time period in which the new capability is to be achieved. (7:77).

. Begin Congressional budget proceedings with an annual review by the appropriate committees of agency missions,

capabilities, deficiencies, and the needs and goals for new acquisition programs as a basis for reviewing agency budgets. (7:78).

LMI Study

This study was requested by ASD(I&L) in September 1972 to examine the genesis of a requirement for a major weapon system. (17:1). The main issue raised by this report is what mechanism exists for relating the generation of requirements to national defense policy and future defense budget plans. (17:2).

The study concludes that most new systems are simply replacements of existing weapons systems because the existing systems are expected to become deficient as time progresses. As a result, the requirements are not expressed independent of the current kinds of hardware used to accomplish a given mission. (17:8). Rather, the requirements are statements of achievable system capabilities countering perceived mission deficiencies relative to the services defense role with a system cost that can be justified. (17:9). The study further concludes that there is no overall framework to judge whether a proposed system development can be accommodated within future DoD resources. (17:19).

This study implies that OSD should be more involved with the beginning stages of a development program to insure that the requirements generation process is within the spirit and intent of DoD policy. (17:11). The Secretary of Defense and the OSD are obligated to examine service requirements for new systems to judge the feasibility of committing large amounts of resources for their development. (17:13).

Acquisition Advisory Group

In April 1975, the Deputy Secretary of Defense chartered the Acquisition Advisory Group (AAG), to examine and assess recommendations made by the services concerning the management of weapons system acquisition at the OSD level. The AAG report deals with a broad range of acquisition process issues including management controls, defense needs, and financial management.

The AAG dichotomizes military requirements into a force level class as expressed in the Joint Strategic Operational Plan published by the Joint Chiefs and into a new equipment class which leads to an acquisition program. In the latter case, there is an extensive amount of effort devoted to providing information useful for making a weapon system acquisition decision; unfortunately, that same data base is not available to Congressional bodies or is not expressed in terms of broad national defense objectives. (14:32). The AAG contends that the requirements formulation and documentation process should not be over-formalized. Rather, there are clear benefits in providing a process and atmosphere that will allow innovation and creativity in the early stages of a new system as well as judgmental latitude in making evolutionary improvements to existing systems. (14:33). The AAG concluded that there are two types of analyses needed to support the formative stages of the acquisition process: (1) a mission area analysis to define deficiencies relative to countering a projected threat; and (2) mission concept studies to define solutions to the expected capability gap. The end result could be a service proposed acquisition program. (14:36). Consequently, the front-end of the acquisition process becomes more structured, and the basis for a system acquisition decision is well documented.

The AAG emphasized that the front-end activity should not become an administrative extension of the DSARC/DCP process. (14:37).

The AAG made the following recommendations concerning Mission Needs and Requirements:

. That a continuing series of Mission Area analyses be established in DoD and initiated and conducted by the Services under the functional guidance of the ASD(PA&E).

. That the Services initiate and conduct Mission Concept Studies to determine ways and means of meeting mission needs under the functional guidance of DDR&E.

. That the Mission Concept Studies explore and evaluate competing system concepts and be used as the basis for development of the initial DCP.

. That the establishment of precise performance characteristics for a weapons system be prohibited until such time as the candidate system is approved for full-scale development. (14:7).

OMB Circular A-109

This Executive Branch circular dated 5 April 1976 establishes the policies for the acquisition of major systems and implements recommendations from the Commission on Government Procurement. (18:1).

The general policy which must be applied by the Department of Defense (DoD) is to express needs in mission terms and not equipment capabilities to foster creativity and competition. The initial activities of the acquisition process should be emphasized so that alternative concepts can be examined to fulfill the mission need. (18:3). The DoD should plan future system acquisitions based on an analysis of its mission and an appropriate resource investment. (18:4). There should be a clear decision point where the Secretary of Defense verifies the mission deficiency and validates the need based on overall capabilities, priorities and resources.

A valid need may be caused by existing capabilities or a technological opportunity. (18:7).

Common Emphasis

The common thread of emphasis for these studies concerns the purpose and process of activities in the formative stages of a new development program. The intent can be summarized in the following three points:

- . The Secretary of Defense should review the total defense requirements in terms of OSD priority and policy as well as expected resource constraints.
- . Requirements should be documented by the services in terms of a defense need rather than specific hardware capabilities.
- . The services should, on a continuous basis, conduct mission area analyses to identify shortcomings in the capabilities of existing defense systems as compared to the capabilities of our enemies. The mission area analyses should be followed by a study of alternative solutions for that defense problem.

SECTION III CURRENT POLICY

DoD policy for the acquisition of major weapons systems is contained in DoD Directive 5000.1. Former editions of this directive emphasized decentralization of program management to the military services along with the responsibility for identifying defense needs and defining systems which satisfy those needs. Because the services were allowed to work independently during the conceptual phases of the acquisition process, the Secretary of Defense did not authorize program initiation until the conceptual system was ready to enter the validation phase.

Front-end Activity

In the current issues of DoD Directive 5000.1 and 5000.2, dated 18 January 1977, the policy guidance provides a restructuring of the conceptual phase. The start of the acquisition process is no longer open-ended but has a definite beginning at Milestone-0. The generalized activities surrounding this beginning point are depicted in Figure 1. Deficiencies in defense capabilities are identified by a continuous study process conducted by the services and entitled mission area analyses. This process provides a mechanism for identifying mission needs. If the perceived need can only be satisfied by a new acquisition program as opposed to changes in tactics or deployment of forces, then the service documents this need in a Mission Element Needs Statement (MENS) in terms of an operational task to be accomplished rather than a system hardware capability. The MENS then becomes an official request from the Service Secretary to the OSD to approve the exploration of alternative solutions to the stated need. The Defense Acquisition Executive (DAE) receives the

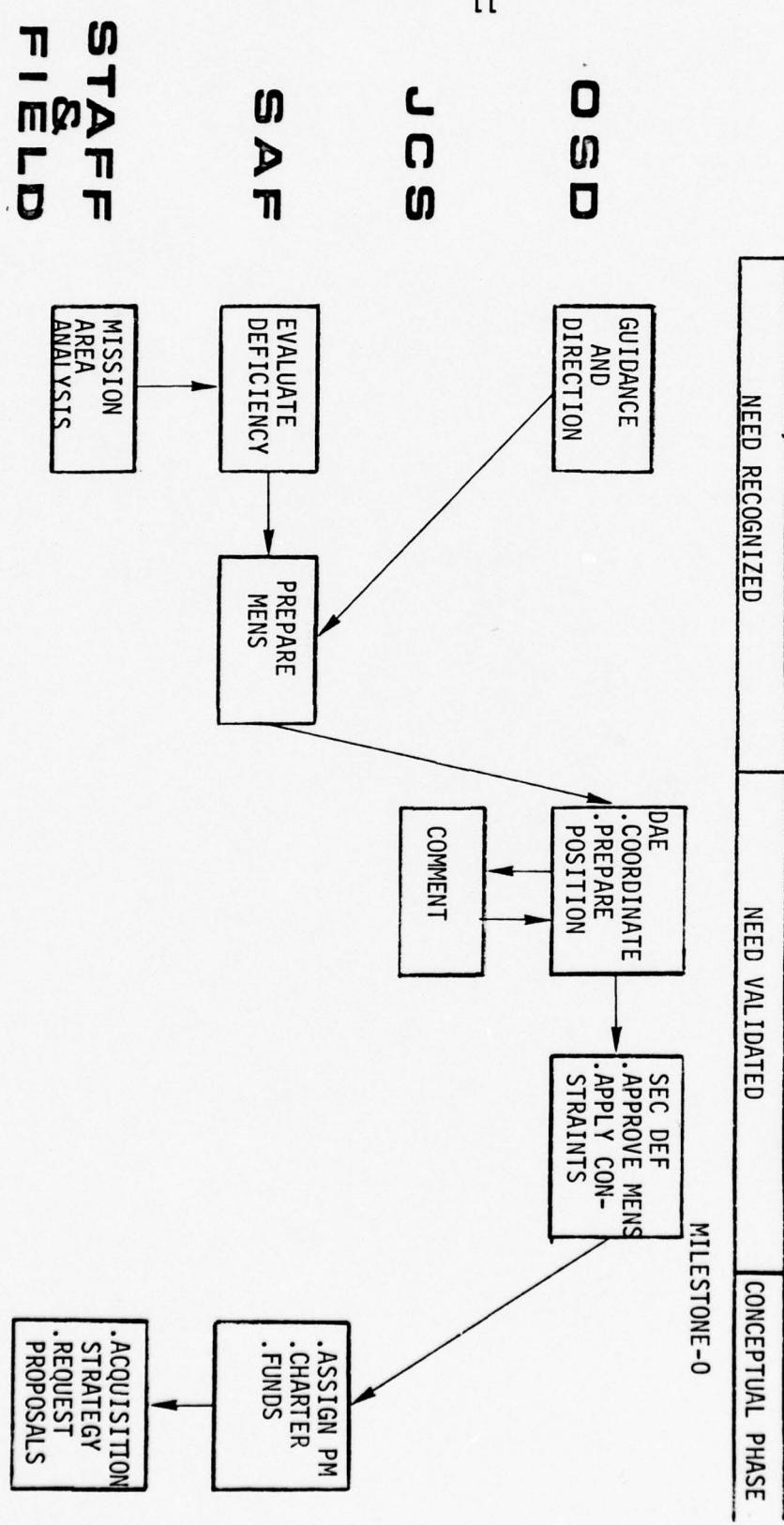


Figure 1. Program Initiation Activities

MENS, then forwards copies to the appropriate offices in OSD and to the JCS for comment. The DAE prepares his own assessment of the documented need along with a recommendation for action. The complete set of comments and DAE correspondence is then sent to the Secretary of Defense for approval. The Secretary of Defense examines the proposed need in terms of defense policy, resources, total force structure, and current political factors. Approval of the MENS and a Milestone-0 decision is the formal authority to initiate the acquisition process. Following that, the Service Secretary names a program manager (PM), establishes a formal charter for the PM, and provides a source of funds to conduct an examination of alternative concepts.

Questions

Because this policy is new and untried, there are a number of unresolved issues regarding its spirit and intent as well as methods for implementing the front-end activities of the acquisition process. Four of these issues are identified in the following discussion.

A MENS will probably be submitted to the Secretary of the Air Force to initiate a major or a non-major program. The Secretary of the Air Force must apply his judgment on whether a MENS should be forwarded to the OSD as a recommended major program. The Secretary of Defense evaluates the recommendation and makes his decision based on his perception of the importance and priority of the identified deficiency in defense capability. The general dollar threshold separating major and non-major programs is an expected cost of \$75 million in research, development, test and evaluation (R&T&E) or \$300 million in production. Since a hardware solution should not exist to estimate the acquisition cost elements, the dollar thresholds will be difficult to apply at Milestone-0. The visibility and

management attention given a major program make it important for the Secretary of the Air Force to make a judicious recommendation to the OSD.

ISSUE: What specific criteria could the Secretary of the Air Force use to propose an acquisition program as a major program?

A mission area is a central unit for the entire process starting an acquisition program. Analyses are conducted in each area; consequently needs are identified relative to mission areas. The current policy does not define the scope, content and boundaries of a mission area but leaves that issue as a future task for the Secretary of Defense. There are several practical ways to delineate mission areas. One way is to establish mission areas corresponding to the appropriate categories of major force programs. Regardless of the mission areas selected by the Secretary of Defense, the Air Force should establish a sub-set of mission areas that are compatible with those provided by OSD.

ISSUE: How could mission areas be delineated in the Air Force?

The Secretary of Defense has delegated the function of mission area analysis to the services. Within the Air Force, neither the Air Staff nor the functional staff for the Secretary of the Air Force conduct continuous, detailed analyses. The Air Force Systems Command does contract for detailed mission area studies so that it can identify shortcomings in existing capabilities and guide technology efforts. In addition, a limited amount of analyses is performed in-house by the Laboratories and the Product Divisions to provide some boundaries and focus for contractual studies aimed at very specific parts of the Air Force mission (e.g., bomber defense weapons for low-level penetration). To comply with the full intent of the new policy, a broader view of mission area analysis is needed within

the Air Force

ISSUE: What Air Force organization should be tasked to perform the mission area analysis?

The primary function of the MENS is to clearly define the mission need without describing a system to fulfill that need. In the past, the Air Force documented its requirements for new systems as well as the rationale for that new capability via a Required Operational Capability (ROC). The ROC is the formal method allowing operational commanders, AFSC, AFLC and ATC to identify deficiencies in their present or future capabilities to perform a mission; and as a result, new programs are generated which compete for funds along with all other RDT&E efforts. The ROC function is very similar to that of a MENS except that a ROC is not aligned to a mission area and does describe preferred solutions.

ISSUE: What will be the relationship between a ROC and a MENS?

SECTION IV

DISCUSSION OF ISSUES

The four issues identified in the previous section are examined in greater detail in the following paragraphs. The observations and evaluation concerning each issue is by necessity very subjective because at present there are no Air Force directives published to cover these subjects. These same four issues are embodied in varying degrees within the three emphasis items described at the end of Section II. That is, requirements should be documented in terms of needs rather than hardware capabilities, the services should conduct mission area analyses and the Secretary of Defense should review requirements in terms of priority, policy and resources.

Major vs. Non-Major Programs

A proposed program becomes a major program only when the Secretary of Defense designates it as major. The qualifier, major, then means that the Secretary of Defense perceives the program as requiring tighter management control by virtue of its importance. Program importance is relative to the urgency in countering a threat, the magnitude of resource investment and the controversy or interest expected from other groups. Because the defense environment is so dynamic, a program initially designated as major could conceivably be redesignated as non-major at some later date. Conversely, a non-major program could be elevated to major as circumstances change.

The policy guidance does indicate a cost threshold for segregating programs into major or non-major categories. Past experience shows that the threshold amounts are merely guidelines and that other factors can

dictate whether a program will be selected as a major program. (16:25). These guidelines are straightforward to apply at Milestone I and beyond because there is a historical data base for particular kinds of weapons (e.g., a new bomber or a new submarine). At Milestone-0, an estimated development cost is not an appropriate criteria for recommending a proposed program for approval as a major program because in theory the weapon system solution is not known, only the defense need is known. In that sense, the cost threshold must be applied in a different way.

One possibility is to view the threshold as a cost ceiling on the total, long-term investment for solving a defense problem regardless of the form of the solution. Consequently, some judgment must be made on the relative worth of spending up to the ceiling amount on that solution so that the corresponding budget allocation can be made. The entire process of judging worth and allocating resources will require a long-term business strategy both by OSD and the Air Force so that a firm commitment to an acquisition program is consistent with defense needs and policies.

Through the MENS, the Secretary of the Air Force will provide his judgment and rationale to the Secretary of Defense for categorizing a program as a major one. Some discriminators other than cost relevant to this judgment are:

- . Urgency in countering the threat.
- . High priority defense mission essential to the nation's security.
- . Potential public or Congressional interest or controversy.
- . Significantly impacts other acquisition programs or existing forces.

- . Potentially involves allied countries.
- . Likelihood that national defense policy or capability could be revolutionized.
- . Involves roles and missions of another service.

The MENS itself signifies that the Secretary of the Air Force views the problem as very important and fully intends to start a program even at the expense of on-going efforts. The relative worth of the stated need is related to the amount of funds identified in the MENS.

In practice, some estimate of the program cost must be made but not the usual life cycle cost estimate. Instead, the cost estimate must be based on past experience and subjective judgment to bound the funds allocated for investing in a solution. If, for example, the stated need is a deficiency in strategic offense, then past experience in developing bombers and missiles provides a rough estimate of the funds needed for development. A precise estimate is not necessary. Only a guideline is needed to scope the investment decision so that funds are reserved until the Milestone I data is available.

Mission Areas

In the past, mission areas corresponded to the mission area summaries provided by DDR&E. These documents summarize the analyses results in a particular functional area in DDR&E along with the Secretary of Defense decisions regarding mission needs and alternative system concepts. The current policy indicates that the Secretary of Defense may redefine the mission areas but has deferred that task at least until the next Defense Guidance Memorandum or Programming and Planning Guidance Memorandum. In general, a mission area is one definable part of the total defense mission

that must be accomplished to fulfill the defense policy. The aggregate of all mission areas must equate to the total defense mission. A mission area can be as broad or as narrow as the Secretary of Defense deems appropriate. A broad area could cut across service boundaries but should not compromise any one service's role or function. Each mission area contains more than one mission element, but any particular mission element could cut across mission area boundaries because a mission element is defined in terms of an operational task that is deficient. This picture of a mission area is depicted in Figure 2.

A mission area can also be viewed in terms of its interface with the services and with Congress. The mission areas must be relatable to the defense strategy when presented to Congress with a level of information that is appropriate for authorization and appropriation decisions. Likewise, a mission element must be describable in broad terms rather than detailed hardware performance especially if that mission element is deficient and a major program is presented to overcome the deficiency. The Air Force should be able to integrate their operational tasks into mission elements which logically fall within one or more mission areas. This interface flexibility is needed so that the Air Force can counter multiple enemy threats under a set of expected scenarios.

There are several sets of mission areas that could be used, but it is beyond the scope of this study to analyze these many combinations. One such set incorporates the various functional areas within OSD. This choice is shown in Figure 3 where the mission areas are strategic offense, strategic defense, tactical air warfare, tactical ground warfare, sea control, mobility & logistics, command control & communications, reconnaissance-surveillance, intelligence, and training.

TOTAL DEFENSE MISSION		
Mission Area 1	Mission Area 2	Mission Area 3
Element A		
Element B		
	Element C	

Figure 2. Mission Elements

MISSION AREAS						
STRAT OFF	STRAT DEF	TAC AIR	TAC GND	OCEAN CONTROL	MOBILITY & LOG	C ³
RECCE & SURV	INTELL	TRNG				
STRAT OFF						
STRAT DEF						
COUNT AIR						
INTERDICT						
CAS						
SP OPS						
AIRLIFT						
C ³						
RECCE & SURV						
INTELL						
RESCUE						
MSN SUP						
TRNG						

Figure 3. Mission Areas versus Air Force Missions

Mission Area Analyses

The purpose of a mission area analysis is to expose those defense tasks within a given area that cannot be adequately accomplished or could be accomplished more efficiently. In that context, the type of analysis performed could range from a very complex computer model study to a subjective evaluation of tasks versus equipment. The analysis could be an integral part of the normal planning documentation process, or it could be a precursor activity of a particular Planning, Programming, Budgeting cycle.

The scope and type of analysis will depend heavily on what organization is performing it, the reason for it and the time available. In practice, the analysis must be accomplished by a "blue suiter" so that the conclusions are credible. The real capabilities of current equipment and the defense tasks are best understood by the Air Force experts who live and operate in that environment. If the analysis is very complex, requires technical expertise not available in the organization, or will require manpower beyond that existing in the organization, then the mission area analysis could be supported by a contracted study effort. However, the bounds placed on that study, the interpretation of results and the application of results should be accomplished within the Air Force.

Mission area analyses should be performed by each Air Force organization which has an appropriate level of knowledge of the defense task, the equipment to perform that task and the technologies which could impact that task by a cost or capability improvement. That does not mean that several different organizations should duplicate each other's analysis, but rather the type and scope of analysis should be consistent with the kind of expertise available and should make a contribution to the total

analysis function. Consequently, the Air Staff, the operating commands and AFSC should all be contributors to the mission area analysis effort.

A top-level, as opposed to a detailed, mission area analysis should be performed by the Air Staff. The purpose is three-fold. The first is to evaluate deficiencies identified by the using commands (e.g., TAC, SAC, MAC and ADC) or the development command (AFSC) in terms of current policy for the total Air Force mission. This evaluation should include some prioritization or relative value assignment of each deficiency in relation to other requirements so that adequate resources can be applied to the most important ones and a proper program balance maintained. The second is to identify deficiencies based on their own data. By their unique position and source of insight into national policy issues, the Air Staff has opportunities for independently determining defense deficiencies that may not require input from the field units. A top-level analysis is also necessary to successfully interact with the OSD relative to total defense needs and balancing total defense resources. Thirdly, an organic analysis capability is a necessary preparatory activity to formulate long-range plans and the Program Objective Memorandum. A top-level analysis could provide insight into the projected force levels and anticipated force effectiveness. Further, it provides perspective on the relative value of programs across the various Deputy Chief of Staff areas and thereby offers a rationale for balancing resources across those areas.

Within the operating commands, the analyses should examine the force levels necessary to accomplish the assigned task in concert with the effectiveness of that force. The effectiveness can be judged in terms of probability of destroying the target base, penetrability, response

time, the initial availability, and the post strike availability. An analysis of the force effectiveness provides an insight and quantification of deficiencies in completing the operational task. The analysis could be extended to determine if the revealed deficiencies can be eliminated (or the effectiveness improved) by a change in tactics. The entire analysis is predicated on a realistic model of the threat including small variations in threat capabilities to account for uncertainty and changes in enemy tactics to refine and improve our own battle plans.

The Air Force Systems Command's mission area analysis should complement those of the operating command. They should also consider joint analyses with the other services in mission areas of common interest like strategic offense, command control & communications, tactical ground warfare and intelligence. Their efforts should examine alternative means for countering the projected threat, and in the process, consider a band of threat growth to examine the sensitivity of our current ability to complete a defense task relative to threat capabilities. The range of alternative means to accomplish a defense task should be very broad and include all possible applications of new technology. The result would be a relative measure of the benefits in performance and cost resulting from the application of new technology into a future system. A side benefit is that the mission area analysis results can also be used to focus and guide future technology efforts. For example, if during an examination of threat capabilities a gap is found in the ability to complete a particular defense task, then the fundamental weakness in our capabilities can be identified. Once the weak spot is known, technologies from many diverse areas can be identified that are appropriate to strengthen the capability. These technologies can then receive increased funding so

that at some future date they are sufficiently developed to be credible alternatives for finding a solution.

ROC vs. MENS

The ROC is a formal document prepared by a major command to communicate an equipment deficiency to HQ USAF. The operational need is normally stated in terms of a particular mission that can no longer be accomplished or cannot be adequately accomplished or a new task is perceived that cannot be accomplished with existing equipment. The ROC also describes how well a mission task must be accomplished and when that capability gap should be filled.

ROC's tend to be very hardware oriented. One explanation is that a deficiency can be described much easier in terms of the type and capabilities of hardware that will indeed solve the operational problem. For example, if a current air superiority fighter can no longer defeat the corresponding enemy fighters, the most straightforward method to describe that operational need is in terms of a replacement aircraft possessing performance parameters superior to the enemy's capability. Consequently, several alternative ways of satisfying that air superiority role such as surface-to-air missiles or high power lasers are excluded from consideration as the requirement. At the first development decision point, the Secretary of Defense has only two choices regarding the weapons system to counter the expected threat, accept the Air Force's offer or reject it.

Fundamentally, the ROC concept and process is compatible with the spirit and intent of the Milestone-0 objectives. The only change needed regards the philosophy and discipline in preparing and validating future

ROCs so that a ROC can become the forerunner of a MENS. On that basis, future ROCs should contain the following kinds of information:

- . A description of the mission task.
- . A statement of the operational deficiency caused by existing equipment based on equipment aging - a change in threat thereby making the present force inadequate, incapable or excessively vulnerable - a change in mission - uneconomical operation. The justification must be stated only in terms of the operational task to be performed, not the new equipment desired.
- . A summary of the threat and operational scenario which caused the deficiency as projected into the time frame of concern. Threat capabilities and numbers must be consistent with published data.
- . An assessment of the consequences if the operational deficiency is not filled possibly in terms of vulnerability of forces, inability to conduct an assigned task, or loss of tactical options.
- . A list of operational constraints which must be applied to proposed systems to overcome the deficiency. This list could include interface with other systems (especially NATO), affordable and timely logistic support, skill levels for repair, intended operational environment, urgency, or acceptable levels of mission accomplishment.
- . A list of viable alternative solutions that need further study. These might be a shift in missions, off-the-shelf equipment, or the application of new technologies. An order of preference could be indicated based on operational considerations.

If a ROC were to contain this kind of information, it could be readily converted to a MENS. In that way, a validated ROC could become one of

several avenues to generate and justify a Milestone-0 decision. There are some advantages to this approach. First, the administrative process is well established. Field commanders who must cope with the consequences of an operational deficiency can identify that deficiency to the development community, thereby keeping the requirements and development community in tune with the operational needs. Technological advances can be applied to make an operational task more efficient or less costly. Finally, a variety of expertise and experience can be focused on solving the problem.

Converting a ROC to a MENS will require that some additional data be added to the ROC. First is an assessment of other Air Force or other service capabilities to accomplish the mission. If a new system is warranted, an assessment should be made of its utility to other services. An assessment of the relative value of filling the need along with the source of funds required to initiate the conceptual phase of a development program.

Not every ROC will require conversion, only those involving major programs. On the other hand, most of the processing will remain constant so that HQ USAF can decide if a major program is warranted.

The general activities starting from mission analysis through ROC preparation and MENS approval is depicted in Figure 4.

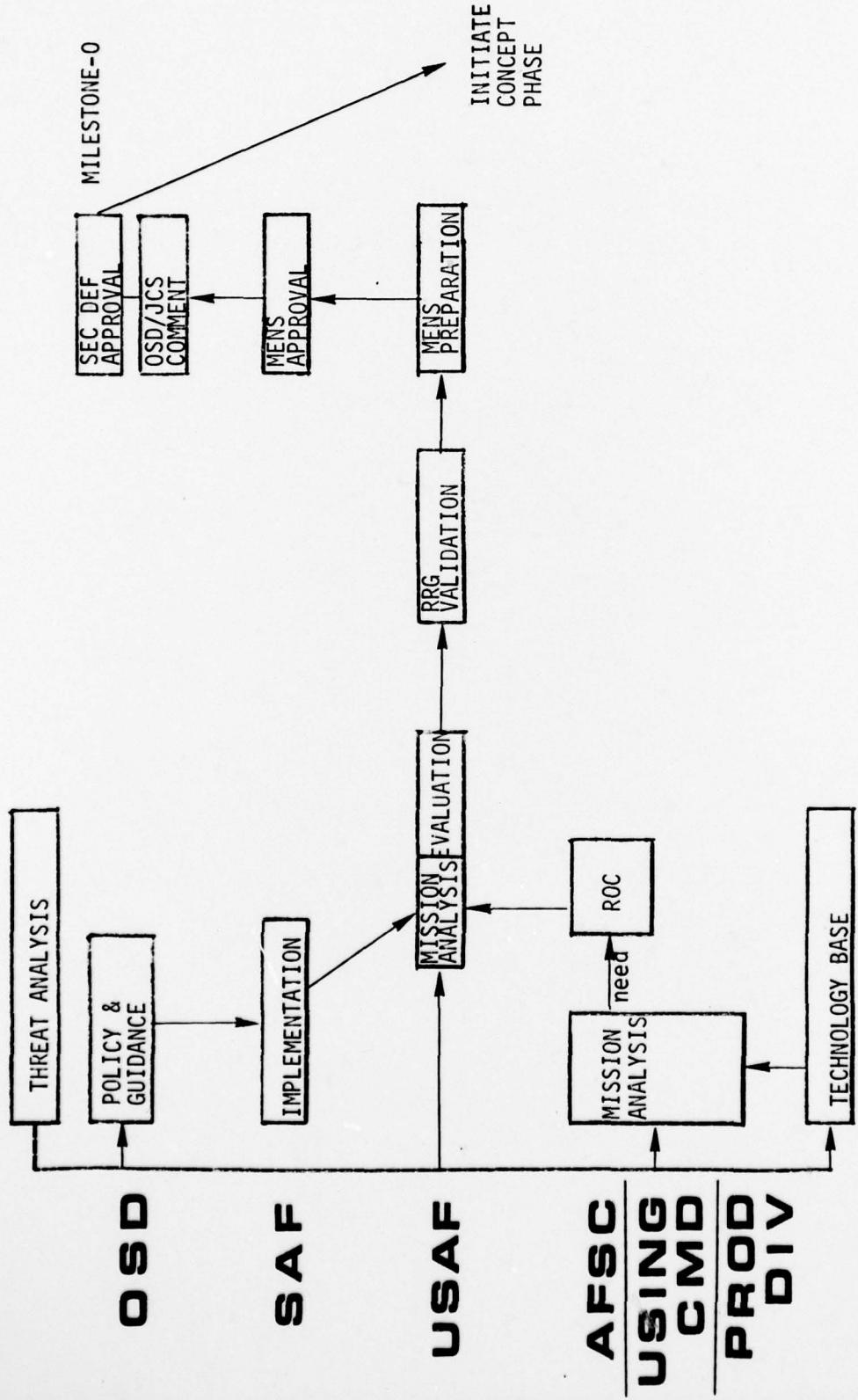


Figure 4. Pre-Milestone-0 Activities

SECTION V

SUMMARY

Policy

The policy contained in DoD Directive 5000.1 and 5000.2, 18 January 1977, has changed the activities leading to the start of a major weapons system acquisition program. A new decision point, Milestone-0, is added along with a new document, a Mission Element Needs Statement (MENS), to support that decision. The principal method for identifying the requirement for a new capability is through mission area analysis. The results of mission area analysis are to be an identified deficiency in the existing or projected operational capability or an opportunity to apply technology to make the operational capability more effective or less costly.

Changes to the front-end of the acquisition process were recommended by several study groups. The current policy does respond to three common recommendations from these studies. The first is that the Secretary of Defense should review the entire set of defense requirements in terms of priority, policy, and resource constraints. Next, defense requirements should be expressed in terms of needs and not hardware capabilities. Third, the services should conduct mission area analyses to identify operational deficiencies.

The Air Force must interpret and implement this policy; consequently, several issues must be resolved. The current directives do not explicitly define a mission area or provide detailed reasons for segregating major from non-major programs. Until the process evolves through trial and error or more detailed guidance is established, the Secretary of the Air

Force must generate his own criteria for recommending that a program be designated as major. Similarly, the Air Force should implement the mission area analysis concept by having the appropriate organizations perform that analysis at a level consistent with its function and capability. The end result, a mission element need must be documented and reviewed consistent with the DoD policy. These four topics are summarized below.

Issues

The present guidance to the Air Force for recommending the initiation of a major program is very general. A major program can be initiated either because of its priority in providing national security or its expected cost. At Milestone-0, the expected cost can be viewed as an investment strategy committing the Air Force to a solution of an identified problem. Other factors which could be used to recommend a program as major are:

- . Urgency in countering a threat.
- . High priority relative to national security policy.
- . Potential Congressional interest.
- . Impact on existing forces or acquisition programs.
- . Interface with allied forces.
- . Likelihood that national defense policy or capability revolutionized.
- . Roles and missions of other services.

Mission area analyses are conducted to identify operational deficiencies. They should be performed by each organization having the information required to identify, to quantify, or to assess a deficiency. At the Air

Staff level, mission area analyses could be used to evaluate deficiencies documented by the operating commands. Analyses could be performed on mission data available in the Pentagon thereby identifying deficiencies independent of the field units. Mission area analyses could also support long-range planning and budget formulation. At the operating commands, mission area analyses can be conducted to evaluate force levels and force effectiveness relative to the expected threat. At the Air Force Systems Command, mission area analyses should complement those of the operating commands. The result is a quantified method for guiding technology efforts and identifying defense tasks having high payoff if new technology were applied.

The MENS documents a new requirement for improving an operational task at the OSD level. The established document within the Air Force serving this function is the ROC. Some change in the philosophy and content of a ROC must be made to make it consistent with the MENS. The content changes are straightforward. The discipline required to state needs rather than hardware capabilities may take some time to develop.

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